The reACT$_2$ant

Winter
2009

Changes are coming!

Volume 16 Issue #1

I hope you are having a good second semester. It is getting harder and harder to get students attention. How do we compete with cell phones, face book etc. If you have any good ideas, please let me know so we can share them with the membership.

There is a commercial about schools not adapting to the ways students learn today. This is probably very true, but it takes time to change and I never seem to find extra time. Is any one using Moodle or Twitter? Do you know of a great online simulation or flash animation? Many of my favorite web-pages are disappearing because the teacher retires. How can we keep the websites active? What can ACT2 do to be a leader in this area? How can the internet keep us connected? Please share your ideas with me so I can pass them on.

Did you know the TEKS are up for final review? Go to the TEA website and look at the draft copy of the TEKS. You can send feedback to the state school board by down loading the forms at **http://www.tea.state.tx.us/teks/HS_ScienceForm.doc** The TEKS are very clear on the content to be taught so now you need to think can most students learn the material for the End of Course Tests that begin in 2012. The TEKS will be voted on in March by the SBOE.

Planning ahead, next years mole day theme will be **MOLAR EXPRESS**. Go to the National Mole Day Foundation Website for more information. The theme for National Chemistry week next year is "**Chemistry– It's Elemental!**" Celebrating the Periodic Table of Elements. Check out the website http://www.2mminutes.com/ This website compares US education to education in India and China. Are we falling behind? What can we do to change the future? How do we get students excited about chemistry? What would Captain Chemistry do? Hang on summer will be here soon.
Meg.

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Board Notes

CAST was great. Many teachers stopped by the ACT2 booth and joined or renewed his/her membership. Many mugs, shirts, and pins were sold. Teachers from every grade marbled his/her name tag. Jeff Hepburn did an excellent presentation at the luncheon speaker. Everyone got a mug plus other freebies and door prizes.

Stephen F. Austin has a Math, Science, & Technology Teacher Preparation Academy starting this summer. Deadline to apply is May 1, 2009. Email: Dr. Kimberly Childs, kchilds@sfasu.edu for more information. There will be both a Masters level class and an undergraduate level class.

BCCE 2010 will be at the University of North Texas on August 1-5, 2010. Webpage:http://bcce2010.org

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the reACTant Volume 16, Number 1 *The reACTant is the official newsletter of the Associated Chemistry Teachers of Texas (ACT_2) and is published three times a year.* *The information published is copywrited to ACT_2 unless otherwise noted. Permission is granted to teachers to reproduce for classroom use. All others should contact ACT_2.*

From the Top

The STAT Board of Directors meeting that took place in Austin on February 21, 2009 and I have a few notes to share from the meeting with the ACT_2 membership.

The first and most urgent information concerns the SBOE meeting on March 26th and 27th. A public hearing will be held on March 25th. Details about the public hearing will be forthcoming and available at http://.tea/state.tx.us/index4.aspx?id=1156. Speakers will be chosen by first to register and those that have not spoken at a previous public hearing concerning the TEKS. There is also a form you can fax to register to speak at the public hearing posted on the following page. http://ritter.tea.state.tx.us/sboe/index.html

Speakers may register between the hours of 8:00 a.m. and 5:00 p.m. (Central Time) on the Friday and Monday preceding the board meeting with the appropriate agency office either by telephone, by facsimile, or in person at the William B. Travis (WBT) State Office Building, 1701 N. Congress, Austin, Texas 78701:

(A) Committee of the Full Board - Office of the State Board of Education, WBT Room 2-190, 512-463-9007, fax: 512-936-4319;

(B) Committee on Instruction - Associate Commissioner for Standards and Programs, WBT Room 3-121Q, 512-463-9087, fax: 512-475-3667;

(C) Committee on School Initiatives – Division of Charter School Administration, WBT Room 5-107, 512-463-9575, fax: 512-936-9281;

(D) Committee on School Finance/Permanent School Fund - Department of School Finance, WBT Room 6-115, 512-463-8994, fax: 512-305-9165;

(E) SBOE Meeting - Office of the State Board of Education, WBT Room 2-190, 512-463-9007, fax: 512-936-4319.

I urge you to write your SBOE representative.

On the TEA web page the most recent revision of the TEKS are posted. (http://ritter.tea.state.tx.us/rules/home/sboeprop.html Kenn Heydrick requested that teachers read the new revisions and e-mail specific feedback. rules@tea.state.tx.us Please specify in your message the rule subchapter to which your comments apply. (subchapter C is high school)

TSELA is also gathering data on the science TEKS K-12. They have posted their proposed changes on their website and will be asking for commentary to take to the SBOE meeting in March. http://www.tsela.org/iWeb/TSELA/Home%20.html.

In the next couple of weeks please take the time to visit the TEA and TESELA website and make sure the opinion of chemistry teachers is heard before this very important decision is made.

CAST 2009 proposal are currently being accepted until April 30th. If you would like to present as part of the ACT_2 strand please send your proposal to Dale Moore at dmoore03@sbcglobal.net or dmoore@aisd.net. CAST 2010 will be in Dallas, 2011 is scheduled for Houston and the 2012 CAST will be in Corpus Christi.

Sincerely;

Rhonda Alexander ACT_2 President

"You cannot hope to build a better world without improving the individuals. To that end, each of us must work for our own improvement and, at the same time, share a general responsibility for all humanity, our particular duty being to aid those to whom we think we can be most useful. " Marie Curie

Workshops Opportunities

ASM Material Camp
Summer 2009

Are you a high school science, technology or math teacher? Are you looking for new, no/low cost lab ideas and experiments? Would you like to earn four CEU credits for FREE? (Or two graduate semester credits.) Most importantly, do you want to engage your students by linking their everyday lives to the larger principles of science and math that they need to learn? This is a great workshop offered all over the US. I have been to the Albuquerque camp and the Houghton camp. Both were excellent and I learned a lot. Use the link below to check out locations and application.

http://asmcommunity.asminternational.org/portal/site/www/Foundation/Educators/TeachersCamp/

ChemEd 2009 Conference (20th Annual ChemEd)

August 2-6, 2009, Radford University, Radford, VA
http://www.radford.edu/~chemed2009
Radford is located in SW Virginia, not far from Blacksburg, home of Virginia Tech and about 40 miles southwest of Roanoke

Dates to remember:
March 1, 2009– deadline for submission of presenter and workshop abstracts.
May 15, 2009– deadline for registration, workshop fees, housing and tours.
This is the **PREMIER** summer conference for HS chemistry.
The chair: Dr. Christine Hermann, Prof of Chem, Dept of Chem/Physics Box 6949,
Radford University Radford, VA 24142
If you want to be added to the ChemEd 2009 email list, to be notified of important events and deadlines, send an email to **chemed2009@radford.edu**

American Vacuum Society Award (AVS Workshop)

The AVS Science & Technology Society will conduct a two-day in-service workshop on low-pressure experiments & modeling for middle school and high school science teachers in **San Jose, CA** on **November 8 - 9, 2009** at the AVS 56th Int. Symposium & Equipment Exhibition. Attendees are sponsored by regional Chapters of AVS with all expenses paid by the sponsoring Chapter! The workshop is nationally certified for CEU's from Howard University and is aligned with the national science standards. Upon completion of the workshop, teachers receive at no cost (1) A certificate of completion (2) 1.4 nationally certified CEU's from Howard University (3) A vacuum system for their school identical to ones used in the workshop.

http://www.avs.org/education.workshop.aspx

More Workshop Opportunities

Science History Tour for 2009

The theme for this tour will be Darwin and Evolution, since in 2009 it will be the bicentenary of Darwin's birth (February 12, 1809) also the 150th anniversary of the publication of Darwin's seminal work, 'On the origin of Species'

Darwin was born in Shrewsbury, where he was educated at Shrewsbury School, then moved on to Edinburgh University, then Cambridge University. He married his cousin Emma Wedgwood, of the famous family of china and pottery manufacturers founded by Josiah Wedgwood, Darwin's maternal grandfather. His paternal grandfather was Erasmus Darwin, an 18th century physician and natural philosopher who was a member of the Lunar Society, a group of well-known industrialists and others that met on the nights of the full moon.

There will be no real commitment until you register. This means that the cost of the trip is unlikely to be less than the 2008 trip, $3850 per person double occupancy. Airfare not included. Science History Tours is a non-profit organization, so you pay only the cost of the trip. Many of our tour members have traveled with us many times, so at least 75% of any tour group is now composed of returning tour participants. Sign-up will start in January and tour payments will be made in 3 installments.

To be included in the tour, or for further information, contact:
Yvonne Twomey: ytwomey@mindspring.com or ytwomey@fnal.gov
Lee Marek: Lmarek@aol.com or lmarek2@uic.edu

ACS summer ChemCom workshops

Teachers can visit www.acs.org/education for more information.

Date	Location	Site
June 21-26	Lake Forest, IL	Woodlands Academy
July 19-24	San Marcos, TX	Texas State University
August 2-7	Hartford, CT	Greater Hartford Academy of Math and Science

CAST 2009—GALVESTON

Come join us in Galveston, Texas for CAST 2009! November 5-7,2009

Conference for the Advancement of Science Teachers is looking for a few teachers to present during the Chemistry Strand. We plan to present the

Apricot Squares

2/3 cup dried apricots
1/2 cup butter
1/4 cup confectioner's sugar
1 cup flour
2 large eggs
1 cup brown sugar
1/3 cup flour
1/2 tsp. baking power
1/4 tsp. salt
1 tsp. vanilla
1 tsp. lemon juice
1 cup chopped nuts

Add 1 cup water to chopped apricots and boil 10 minutes. Mix the next three ingredients well, press into a 9x 13 pan and bake for 20 to 25 minutes at 325 degrees. Beat the eggs and add the brown sugar then stir in the next five ingredients. Fold in the chopped nuts and apricots. Pour over the crust and bake for 20 minutes at 325 degrees. Cool and dust with powdered sugar.

The Best Thumbprints

1 Cup butter or margarine, softened
1/2 cup sugar
1 egg
1 tablespoon vanilla
3 cups All Purpose Flour
1/2 teaspoon baking powder
1 to 11/2 cups finely chapped nuts
Bama jams, jellies or preserves

Heat oven to 375 degrees. In large bowl, beat butter and sugar until light and fluffy. Add egg and vanilla; mix well. Spoon flour into measuring cup; level off. Add flour and baking powder; mix until dough forms. Shape dough into 1-inch balls.* Roll in nuts. Arrange balls 2 inches apart on ungreased cookie sheet. Using finger or tip of wooden spoon, make a deep indention in center of each ball. Fill each with heaping 1/4 teaspoon of jam. Bake at 375 degrees for 10 to 15 minutes or until light golden brown. Cool on wire racks. Makes about 4 dozen cookies.

I can't believe I made butter

Background: Butter is made by removing the fat from the milk. When milk first comes from a cow, the butterfat is in the form of droplets that are suspended in the mixture. If fresh milk is allowed to stand, fat droplets rise to the top. To make the butter from cream, the fat droplets are forced to come together and form larger drops which separates the water out of the mixture.

Procedure: Put cold whipping cream in a clean jar with a marble and screw on the lid tight. Shake the jar until butter forms. Add salt to taste. Spread on crackers to eat.

Classroom Analogies

The Camel that acted as an Enyzme
Once upon a time ______________________

A wealthy Sultan died. His will was very explicit about how he wanted his camels divided among his sons. It stated:
The oldest son to inherit 1/2 of the camels.
The middle son to inherit 1/3 of the camels.
The youngest son to inherit 1/9 of the camels.

But, when the estate was evaluated they counted 17 camels!

A DILEMMA——— How to divide the camels among the sons?

1/2 x 17 = 8.5
1/3 x 17= 5.6666
1/4 x 17 = 1.8888 ....

A neighbor heard that the will could not be executed because none of the sons would give up his fraction of a camel ———

So the neighbor donated a camel to the estate — making 17 + 1 = 18 camels
The instructions in the will could now be carried out-
The oldest son to inherit 1/2 x 18 = 9 camels
The middle son to inherit 1/3 x 18 = 6 camels
The youngest son to inherit 1/9 x 18= 2 camels
And since 9 + 6 + 2 = 17 camels, THE NEIGHBOR WAS ABLE TO TAKE BACK HIS CAMEL !

Thus, the camel acted as an Enzyme—

1. It was required in small amounts
2. It allowed the reaction to go to completion.
3. It was not itself consumed.

From podcasts by Jonathan Bergmann and Aaron Sams

NO NAKED NUMBERS ! All numbers must have units and a name.
Example: 2.5 mols H_2O.

From Richard Meeks, Lamar High School Security Guard.

To remember Hund's Rule:
Everybody gets firsts before anybody gets seconds. So the five 3d orbitals all have one electron before the electrons can begin to pair up.

Example: $[Ar]\underset{4s}{\underline{\uparrow\downarrow}}\ \underset{3d}{\underline{\uparrow\downarrow}}\ \underset{3d}{\underline{\uparrow}}\ \underset{3d}{\underline{\uparrow}}\ \underset{3d}{\underline{\uparrow}}\ \underset{3d}{\underline{\uparrow}}$

Free educational resources: http://www.free.ed.gov/subjects.cfm?subject_id=41

Concord Consortium: http://www.concord.org/ Check out the molecular workbench stuff.

Dan Damelin Chemsite: http://chemsite.lsrhs.net/ Great flash media under resources.

More Workshop Ideas

Mastery Learning-21st Century Learning Workshop Vodcasting-Jonathan Bergmann and Aaron Sams, Woodland Park SD (3 day workshops)

Educational Vodcasting and the Woodland Park School District would like to invite you to come this summer to one of two conferences. We will be doing 3-day conferences where we will teach you:

1.How to use video podcasts to transform the way you teach.! No longer be the "sage on the stage."

2.Implement mastery learning.! Assure that kids know material before they move on.

There are two conferences and both cover the same content:

a.**June 22-24, 2009**:! You can register directly by going to:
https://www.regonline.com/21stCentJune

b.**Aug 4-6, 2009**:! You can register directly by going to:
https://www.regonline.com/21stCentAug

These classes will be held at Woodland Park High School in beautiful Woodland Park, Colorado. We are a small mountain town at the base of Pikes Peak.

Go to: **http://learningformastery.com** to find out more information and to register.

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Purchase a DVD of Chemistry & AP Chemistry Podcasts

(Jonathan Bergmann and Aaron Sams)

There are 2 DVD's Available:

1. **AP Chemistry:** All of the lectures and follow along notes for AP Chemistry from Jonathan Bergmann and Aaron Sams.
Cost = $25
2. **1st Year Chemistry:** All of the video podcasted lectures for their first year course. Included are all 10 of their packets which include labs, notes, etc.
Cost = $25 Or you can buy both for $40.

http://chempodcasts.com

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From Jane Smith:
http://www.strangematterexhibit.com/index.html Check out the nanoworld of strange matter.
Stoichiometry: http://www.lsua.us/chem1001/stoichiometry/stoichiometry.html

From Meg Young:
Molecules that Matter: http://tang.skidmore.edu/pac/mtm/ Exhibit will be coming to Baylor but no date yet.

Reflections, Jokes, Cartoons

Reflection to try:

Antoine Lavoisier, the "father of chemistry", listed lime as a chemical element in his table of 33 known elements. Which of the following observations shows that lime cannot be an element? Justify your answer

a. When a certain soft metal is burned in oxygen, lime is produced (with no other products).
b. Lime reacts with water, generating a large amount of heat.
c. Lime reacts with acid, generating a large amount of gas.
d. Lime and carbon dioxide are produced when limestone is roasted.

Chemistry Jokes:

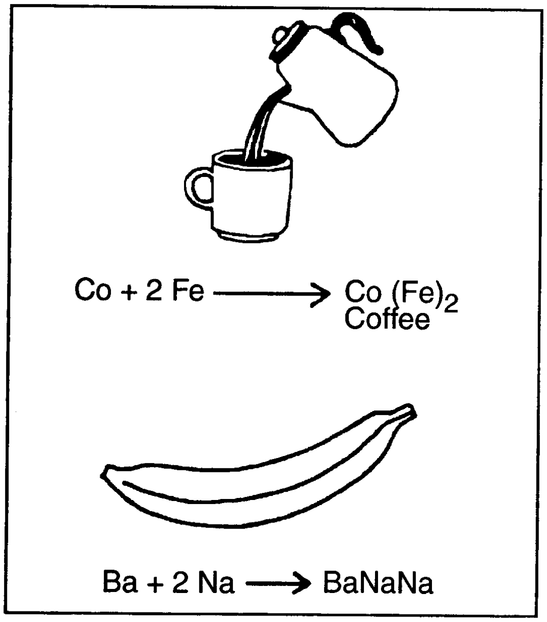
- A small piece of ice which lived in a test tube fell in love with a Bunsen burner. "Bunsen! my flame! I melt whenever I see you" said the ice. The Bunsen burner replied :"It's just a phase you're going through".
- What did one titration tell the other? Let's meet at the endpoint.
- Why are chemists great for solving problems? They have all the solutions.
- Every dipole has its moment.

Chemistry Analogy: FAT CAT

electrons travel **f**rom **a**node **t**o **cat**hode

Atomic Sublevels - s, p, d, f

Smart People Don't Fail *or* Some People Do Fail



off the mark
by Mark Parisi
www.offthemark.com
THE IRON ADDS SUPPORT, THE HELIUM KEEPS IT LIGHT, THE SILICON MAKES IT SMOOTH, THE URANIUM WARMS YOUR DRINK...
comics.com
THE PERIODIC COFFEE TABLE

Penny Sconzo

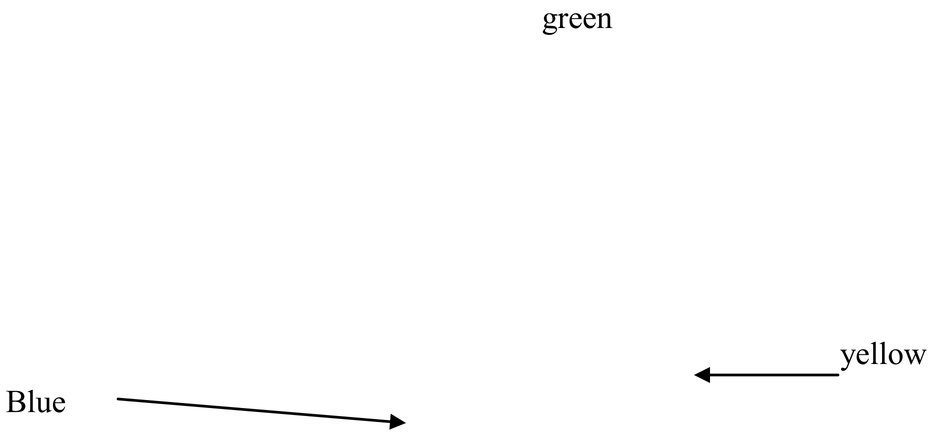
Electrolysis of Water (In Living Color!)

Description:
Sodium sulfate solution containing bromthymol blue indicator is electrolyzed in a Hoffman apparatus. Initially, the solution is green. As electrolysis proceeds, one arm of the apparatus fills rapidly with gas, and the solution in the arm turns blue. The other arm fills less rapidly with gas, and its solution turns yellow. Gas from the first arm of the apparatus pops with a burning splint. Gas from the other arm causes a glowing splint to burst into flame. After the electrolysis is finished, the liquid in the apparatus is pured into a beaker, and the indicator's original green color reappears.

Materials:

Hoffman apparatus	power supply from physics
2 electric leads with alligator clips at both ends	1 M HCl, 6 mL
200 mL of 0.1 M Na_2SO_4(2.8 g/200 mL)	1 M NaOH, 6 mL
Bromthymol blue solution(BTB)	dropper
1-Liter beaker	wood splints
2 medium-sized test tubes	

Procedure:
1. Before demonstration: Prepare Na_2SO_4 solution and BTB solution. To Na_2SO_4 solution, add enough BTB solution so that the mixture is definitely colored. Adjust the color of the solution to GREEN: If it is blue, add drops of 1 M HCl. It is yellow, add drops of 1 M NaOH.
2. In front of class: Set up Hoffman apparatus as shown below and begin electrolysis.



3. While electrolysis is occurring, show students the colors of bromthymol blue in acid (use HCl-yellow) and in base (use NaOH-blue).
4. After each arm of the apparatus contains at least 20 mL of gas, note the following:

- The volume of gas in each arm.

The color of BTB in each arm.

5. Now put small samples of each gas into a test tube and test each sample with a glowing splint and burning splint.

From this information, write the equation for the reaction that occurs in each arm of the Hoffman apparatus.

Example: One arm of the apparatus contains twice the volume of gas as the other arm. Gas from the first arm pops with a burning splint. The color of the liquid in this arm is blue.

H_2= product (based on behavior of gas with splint and on volume of gas)
OH^{1-} = product (based on indicator color)
H_2O= reactant (electrolysis began with neutral solution)
Partial equation at this point: $H_2O \rightarrow H_2 + OH^{1-}$
Balanced for everything but charges: $2\ H_2O \rightarrow H_2 + 2\ OH^{1-}$
Electrons= reactant (to balance charge)
Overall balanced half reaction: $2\ H_2O + 2e^- \rightarrow H_2 + 2OH^{1-}$

6. Pour all the liquid from the apparatus into a 1000 mL beaker. The resulting green color of bromthymol blue indicator shows that H_3O^+ and OH^{1-} produced during electrolysis exactly neutralize each other.

Student Hands-On Electrolysis of Potassium Iodide

1. Cut a one inch piece of clear tygon tubing. I am guessing about 3/8" diameter.
2. To 5 mL of 0.1 M KI add a drop of phenolphthalein. Mix then draw into a pipet.
3. Fill the piece of tubing with KI solution. Snap a battery cap on a nine volt battery and put one lead in one side of the tube and the other lead in the other side of the tube.

Discussion:

Electrode reactions are as follows:

Oxidation/anode:	$2I^{1-} \rightarrow I_2 + 2\ e^-$	E= -0.53 V
	(brown)	
Reduction/cathode:	$2H_2O + 2e^- \rightarrow H_2 + 2OH^{1-}$	E= -0.83V
	(pink with phenolphthalein)	
Net reaction	$2I^{1-} + 2H_2O \rightarrow I_2 + H_2 + 2OH^{1-}$	E= -1.36V

E for the net reaction is -1.36 V. By convention, the negative sign means the reaction will not proceed spontaneously as written. This nonspontaneous reaction will occur only if an external potential greater than +1.36 V is supplied, e.g., by a battery. Contrary to expectations of many students, the observed reduction is NOT:

$K^{1+} + 1e^- \rightarrow K^o$ E= -2.93 V

In this cell, two different reductions are possible: reduction of K^+ to K^o (E=-2.93V), and reduction of H_2O to H_2 and OH^- (E=-0.83 V). When two different reductions are possible, the reduction occurs which has the less negative value of E. Thus, the observed reaction is reduction of water.

by Jeff Bracken

Decomposition of Baking Soda

Background:

Due to the widespread use of sodium bicarbonate (commonly called baking soda) in many food products, the thermal decomposition reaction has been studied extensively by food chemists. Baking soda is used to prepare cakes in order to insure that cakes "rise" as they bake.

As the temperature of the cake batter reaches approximately 50°C, the baking soda decomposes and carbon dioxide is released. The use of baking soda is especially popular in pancakes and waffles since the high cooking temperatures of 350-450°F (175-230°C) cause the carbon dioxide to be liberated before the dough has set. Thus, the batter rises before it sets, and we get a light and tasty finished product.

There are three possible chemical reactions that could be occurring during the baking process. All three of these reactions shown below are theoretically possible, yet only one reaction actually occurs.

Possible Decomposition Reactions:

sodium bicarbonate → sodium hydroxide + carbon dioxide
(solid) (solid) (gas)

sodium bicarbonate → sodium oxide + carbon dioxide + water
(solid) (solid) (gas) (gas)

sodium bicarbonate → sodium carbonate + carbon dioxide + water
(solid) (solid) (gas) (gas)

Problem:

The goal of this lab is for you to experimentally determine which of these three reactions is correct. Your job is to use stoichiometry to determine which decomposition reaction is actually occurring inside the crucible.

Equipment Available:

- Crucibles (lid not required) Jeff recommended the use of copper end caps (1” or 3/4”) from Home Depot that had been heated twice in the Bunsen burner to a black patina.
- Baking Soda
- Balances
- Crucible tongs
- Weighing boats
- spoons
- metal spatula

Safety Concerns:

Students should wear safety goggles and laboratory aprons throughout this experiment.

Lab Continued

Directions:

1. Measure the mass of the empty crucible. _________
2. Place the empty crucible on the balance pan and then press the reset button. Once you see all zeros, carefully add a certain amount of baking soda and record the mass of the baking soda. The amount of baking soda should be between 1.00 and 8.00 grams. _________
3. Set up the ring-stand with the smaller circular ring clamp. Place the metal crucible directly onto the wire gauze.
4. Heat the crucible and its contents with the Bunsen burner for eight minutes. Use a spatula to carefully break up any "clumps" that form as the heating proceeds. The clumps only have to be broken up **once** during the heating process.

   Mass of crucible and final product _________

Lab Report:

Each person will be required to submit a lab report containing the items listed below in separate sections with the following headings:

1. Purpose
2. Potential Chemical Reactions
   Balanced chemical equations with proper chemical formulas for all three possible decomposition reactions.
3. Data Table
   that contains all laboratory measurements with proper units
4. Calculations
   stoichiometric mass predictions for each possible reaction
5. Conclusions
   based upon your results. How did you rule out the two other chemical reactions?

Teacher Notes:

Jeff is a great innovator and used metal crucibles to do this lab. He realized that most teachers don't have big budgets so he found a substitute for the expensive metal crucibles– copper end caps. These crucibles can be cooled quickly on a wet paper towel. Beware your lab benches may not be heat proof so use a ceramic tile to protect them just in case.

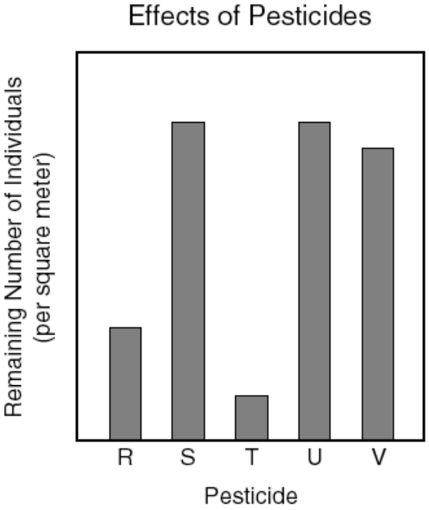
If you use the 3/4" end caps, the maximum they can hold is 5.00 grams. You can assign the mass of baking soda to be used to simplify checking. Directions can be changed so that it can be done on a centigram balance.

Mary Hardin Baylor has a new program where it will loan certain equipment to chemistry teachers in the area so that teachers can still provide a quality lab program to the students. Dr. Watson said many of the teachers he works with have budgets of less than $100 so they can't afford a spec-20, but he can loan them one. What a great program– check it out by contacting Dr. Watson at dwatson@umhb.edu.

TAKS Review Obj. 1

Strategy: * The very first thing you need to tell your students is if there is a drawing, picture, graph, data table, or diagram, that accompanies a question, you always need to look at it and do everything you can to understand it before you even begin to read the question. Make sure that you do your best to understand the actual trend of the graph, the title, the x and y-axes, and any other information before you read the question.

REASONING: TAKS often writes their question with a bias. If you read their question first, you will look at the graph or chart, etc. with a bias/slant and will answer it incorrectly. The incorrect answer is always an answer choice and you could possibly choose it and actually feel good about your WRONG answer. This is NOT GOOD. This is the exact opposite of what the English Department tells them to do, so make sure that they under and that this rule only applies to their Science TAKS test.



The graph shows the results of a study testing chemical pesticides on a pest species common to cotton plants. Different chemical pesticides were used in five different areas. According to these results, which of the following is the most effective chemical for controlling this pest species?

A R
B S
C T
D V

STRATEGY: The x affects the y. When looking at a graph the x-axis is the independent variable and the y-axis is the dependent variable. (This is the same as in math). In science however, we get more specific. By looking at a graph or reading a paragraph, the x-axis is what the scientist manipulated (changed) and the y-axis is what responds to the manipulation. Y-axis is also what the scientist measured.

REASONING: DRY MIX

Dependent, responding- goes on the y

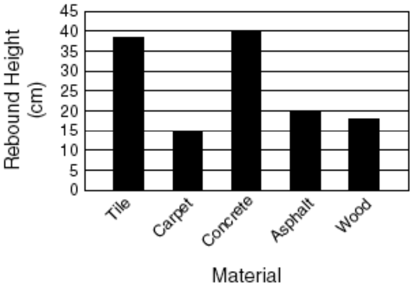
Manipulated, independent-goes on the x

TAKS asks these question in both graph and paragraph form. This is a skill that should be continually assessed during your curriculum.

EXAMPLE:

1. In an activity, a ball is dropped from a height of 100 cm onto five different materials. The rebound height of each drop is shown in the graph. Which of the following describes the hypothesis most likely being tested?

A The mass of the ball affects the rebound height.
B The material the ball is made of affects the rebound height.
C The height the ball is dropped from affects the rebound height.
D The surface the ball is dropped onto affects the rebound height



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